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Making measurements on parallel frequencies in a radio communications device

The invention relates in general to measurements by means of which a radio apparatus attempts to find out the quantity and quality of radio-frequency oscillation in its operating environment. In particular the invention relates to measurements directed to frequencies other than that used for transmission and reception by a radio apparatus in a code division system during the measurements.

A communications link between a cellular radio system base station and terminal requires that the terminal transmits at a certain first frequency and receives at a certain second frequency which may be the same as said first frequency if the transmission and reception are otherwise separated by means of a duplexing method. Optimal link quality requires that the terminal selects a base station with a strong signal, and a frequency with as little noise and interference as possible.

Cellular radio systems applying code division multiple access (CDMA) have so far been mainly so-called single frequency networks (SFN) in which the whole system uses only one frequency band. This kind of an arrangement is used e.g. in the North-American IS-95 (Interim Standard 95) system. Frequency ranges used by other types of cellular radio systems are usually divided into several parallel frequency bands which can be called carrier wave frequencies or just frequencies in short. Proposals for future cellular radio systems have also put forward systems based on code division multiple access which have several frequency bands e.g. to separate hierarchically arranged cells from each other. This requires that a system be developed with which a receiver in such a system can carry out measurements not only at the frequency used, but also at other frequencies in order to find out how much there is other traffic and noise at the other frequencies.

A measurement means that the receiver in a terminal is tuned to the frequency measured and the required observations are made concerning the quantity and quality of the signal received, such as the mean power level at the frequency measured and its temporal distribution, for example. The receiver is tuned by changing the mixing frequency brought to a mixer in the receiver. When the receiver is tuned to the frequency measured it naturally cannot simultaneously receive a signal at the communications frequency used. So, the measurement of parallel frequencies cannot be carried out coincidentally with the reception of the desired signal at the communications frequency used.